Exemption No. 5704

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of

Dornier Luftfahrt GmbH **Regulatory Docket No.27157**

for an exemption from § 25.562(b)(2)
of the Federal Aviation Regulations

PARTIAL GRANT OF EXEMPTION

By undated petition EL10-339/93 transmitted by Luftfahrt-Bundesamt (LBA) letter I 213-2534/87-1-192.93 dated April 14, 1993, Messrs. Krause, Staudlin, and Gritzbach, Dornier Luftfahrt GmbH, Postfach 1303, D-7900 Friedrichahafen 1, Federal Republic of Germany, petitioned for exemption from the floor distortion test requirement of § 25.562(b)(2) of the FAR, for the pilot and co-pilot seats in Dornier 328 airplanes.

Section of the FAR affected:

> Section 25.562(b)(2) Amendment 25-64, in prescribing the conditions under which seats must be tested, requires in pertinent part that where floor rails or floor fittings are used to attach the seating devices to the test fixture, the rails or fittings must be misaligned with respect to the adjacent set of rails or fittings by at least ten degrees vertically (i.e., out of parallel) with one rolled ten degrees.

The petitioner's supportive information is as follows:

> The petitioner bases its request for exemption from the floor warpage test requirement on:
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> 1. An analysis of several gear-down and gear-up survivable crash scenarios, which concludes that any resulting floor warpage is practically negligible.
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> 2. The gear-up crash of a Dornier 228 airplane, characterized as a very severe one, in which all five occupants were uninjured. Although the effects of this crash on seat attachments is not described, it is concluded that the lack of flightcrew injuries proves that the attachments were not significantly affected. It is pointed out that the Dornier 228 has only 16 inches of fuselage below the cockpit floor, whereas the Dornier 328 has 29

inches.

The petitioner states that:

1. Granting the petition would be in the public interest because it would save the manufacturer and operator the expense of seat redesign and recertification. Required compliance would not result in any commensurate increase in safety, but it would tend to increase overall cost and thus increase air fares.

2. By granting this petition operating weight is saved thus increasing the operational and efficiency flexibility of the aircraft.

3. This exemption will not adversely affect safety because of the fact that during an otherwise survivable crash, the seats will stay attached to the cockpit floor structure. Thus for all known load cases, it can be asserted that the structure of the lower front fuselage is capable of sustaining the unwarped integrity of the cockpit floor.

4. The seat was designed, built and tested in accordance with the acknowledged FAA requirements at the time when the seat was developed and tested.

The FAA letter to IPECO dated March 5, 1990, declared that there is no evidence to indicate that floor buckling has been a significant factor in crew seat failures during survivable crash conditions, that the FAA is initiating rulemaking to delete floor warpage test requirements for flight deck seats, and that in the interim, the FAA will consider granting exemptions from this requirement for flight deck seats only.

IPECO, the manufacturer of the Dornier 328's cockpit seats, submitted material in support of the petition. IPECO points out that it was not until approximately two years after the above-noted letter, that the FAA clarified by letter dated March 31, 1992, to the British Civil Aviation Authority, that the aforementioned exemptions would only be considered in cases where the underseat frangible fuselage structure exceeded 40 inches. IPECO asserts that the redesign and recertification costs associated with now complying with this requirement without exemption would be a heavy financial penalty of approximately £ 250,000.

IPECO asserts, in any event, that the Dornier 328 aircraft has in excess of 40 inches of frangible structure measured from the flight deck floor at the center of the pilot's seat to the lower fuselage contour at the constant fuselage section. IPECO provided a Dornier drawing to illustrate this dimension.

A summary of the Dornier 328 petition was published in the Federal Register on May 28, 1993 (58 FR 31063). No comments were received.

The Federal Aviation Administration's (FAA) analysis/summary is as follows:

The FAA adopted improved seat standards with Amendment 25-64 to Part 25 of the

FAR (53 FR 17640, May 17, 1988). That amendment became effective June 16, 1988, and it applies to all transport category airplanes for which an application for type certificate is made after that date. The type certification basis established for the Dornier 328 includes compliance with § 25.562(b)(2) Amendment 25-64. The intent behind the misaligned seat fitting test requirement is to assure a certain degree of seat flexibility, and the requirement is applied irrespective of any floor requirements or anticipated floor behavior. The structure utilized by the petitioner to achieve a high degree of stiffness and rigidity may act to increase crash loading on cockpit occupants, by effectively reducing the fuselage crush distance that would otherwise be available to absorb impact forces. Consequently, stiffness characteristics of cockpit floor or fuselage structure may not be used as a basis for exemption from seat test requirements.

On the other hand, the FAA acknowledges that the noted March 5, 1990, FAA letter has the potential, if not carefully considered, to mislead the recipient into incorrectly assuming that implementation of the stated intentions was a foregone conclusion. It must be noted, however, that the airplane's established certification basis still determines the requirements that must be met regardless of the status of rulemaking that may be contemplated or in progress concurrent with any certification activity. This is well known within the aircraft manufacturing community. In developing its product contrary to this convention, the petitioner also apparently overlooked the prompting statement in the noted letter which advised the recipient that the FAA will consider exemptions on the subject. Had Dornier petitioned for that exemption in a timely manner, there may have been sufficient time following the FAA's response to that petition to develop seats that met certification requirements.

However, in view of the noted letter's unintended impact, the FAA considers it appropriate to grant some relief to allow a limited period of time beyond the scheduled September 30, 1993, type certification date of the Dornier 328 for the petitioner to complete development of the required seats, providing that a retrofit of any non-compliant seats is accomplished. A full grant of exemption in accordance with the 40-inch criteria discussed in the noted March 31, 1992, FAA letter is not warranted for the Dornier 328: Dornier's petition and IPECO's submitted Dornier drawing clearly indicate only a 29.09-inch fuselage crush dimension (IPECO's measurement is erroneously taken to the main gear nacelle, which is not the required constant section reference point).

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest, and will not significantly affect the level of safety provided by the regulations. Therefore, pursuant to the authority contained in §§ 313(a) and 601(c) of the Federal Aviation Act of 1958, delegated to me by the Administrator (14 CFR 11.53), the petition of Dornier Luftfahrt GmbH for exemption from the misaligned floor fitting test requirement of § 25.562(b)(2) of the FAR, for pilot and co-pilot seats on Dornier 328 airplanes, is granted, with the following provisions:

1. The petitioner shall provide this office, within one month from the issue date of

this grant, with a commitment to complete the required testing in a timely manner.

2. Within three months of completing the required testing, the petitioner shall provide this office with a schedule for the retroactive implementation of any design changes required, and assure its completion by June 30, 1994.

3. This exemption expires June 30, 1994. The airworthiness certificates issued for any U.S. registered airplanes that have not been shown to comply with § 25.562(b)(2) by that date will also expire on that date, accordingly.

Issued in Renton, Washington, on

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Transport Airplane Directorate
Aircraft Certification Service